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## THE FORTH AND CLYDE SHIP CANAL

There has been considerable discussion in Great Britain at various times, and especially since the beginning of the Canal Revival, about the year 1900, of a ship canal across the narrow isthmus-like piece of land between the estuaries of the Forth and the Clyde rivers in Scotland. Resolutions in favor of the project have been passed by the town councils of the particularly interested cities of Glasgow, Stirling, and Greenock; and Parliamentary commissions have investigated the scheme, both from the commercial and from the naval points of view. Since the project is of tremendous size, and since it has attracted no little attention in the United States, a brief account and criticism of the proposition is well worth our attention.

There has long been a small barge canal connecting the opposite coasts of Scotland *via* the Forth and the Clyde; but it is urged that a deep channel, permitting the passage of large ocean steamers and of Dreadnought battleships, has become essential to meet the needs of modern commerce and modern warfare.

On the commercial side, advocates of the scheme call attention, in the first place, to the fact that the canal would save, for vessels traveling between the Irish and North seas, the long journey of over four hundred miles around the northern end of Scotland; similarly, it would eliminate a somewhat less distance for vessels bound from Germany to the ports of North America.

In the second place, it would permit a much readier assembling of a full cargo. The once numerous small "tramp" steamers are rapidly disappearing from the sea, giving way before the demand for large vessels and through cargoes. At the present time it is difficult for a large vessel to secure a full load on either Scottish coast, alone; but if the proposed ship canal were opened, it would become possible for ocean vessels to load in part on the east coast and then complete their cargoes

in the port of Glasgow. The present trouble and expense of having to travel all around the Scottish coast in order to pick up a respectable cargo is a serious handicap to shipping interests. It is thought, also, that continental vessels would easily be induced to stop at Glasgow or Grangemouth and pick up traffic, while en route for the United States. Much encouragement for this belief is found in the fact that there is an abundance of cheap bunker coal along the proposed canal routes, which might well prove attractive to foreign shipowners.

The strategical importance of the scheme would arise from the possibility it would insure of a rapid mobilization of naval vessels on either the North Sea or the Irish Sea in time of emergency. The exigencies of war, moreover, often require the quick repair of damaged ships, and this canal would open up the great shipyards on the Clyde to the use of His Majesty's navy in time of need. On the strength of these naval advantages aid in the carrying-out of the project has been asked of the imperial government.

Two different routes have been proposed. Since the fate of the scheme has hinged largely upon a choice of routes, it is necessary to present here a brief statement of the alternate projects:<sup>1</sup>

1. The first route would follow the course of the present Forth and Clyde barge canal from Grangemouth on the east coast (Firth of Forth) to Yoker on the Clyde, below Glasgow. The total length would be thirty miles and the elevation to be overcome thirty-five feet. Various estimates of the probable cost of this plan have been submitted, but none can be regarded as other than tentative. Mr. Hogg, an engineer, estimates that for a depth of twenty-six feet with a bottom width of 110 feet the cost would be \$35,000,000; while for a depth of thirty feet the amount would probably reach \$50,000,000. Other estimates have placed the cost as high as \$100,000,000, and D. & C. Stevenson regard the amount needed as \$135,000,000 in case deep cuttings, as seems advisable, were substituted for all of the locks except those at either entrance.

<sup>1</sup> *Report of Royal Commission on Inland Navigation*, VII, 180-81.

2. The second route would start at a point one and one-fourth miles above Grangemouth and proceed past Bannockburn and Stirling to Loch Lomond, a distance of thirty-five and one-half miles; thence thirteen and one-half miles to Tarbet; thence one and three-fourth miles to Loch Long, an arm of the sea, some fifteen miles distant from the Firth of Clyde.

The advantage of this route is that it is nearly level, and would require but two locks. It is estimated that the cost would approximate \$100,000,000 for a depth of thirty-six feet and a bottom width of one hundred feet.

The Committee of Imperial Defense investigated the strategical side of the question last year and submitted a report thereon in June, 1909, in which it is stated that the minimum dimensions required by the Admiralty are as follows:<sup>2</sup>

Depth .....	36 feet
Width of floor .....	148 feet
Length of lock .....	850 feet
Width of entrance .....	110 feet
Depth of locks .....	36 feet

It was further reported that only the second, or Loch Lomond route, would satisfy the naval requirements. For this route the estimated cost given above was \$100,000,000 for a bottom width of 100 feet; since nothing short of a floor width of 148 feet, almost a half greater, will satisfy the Admiralty, we must conclude that the total cost of the project would far exceed \$100,000,000, even granting that estimate for the size named to be in reality conservative, something truly unique in canal engineering estimates.

The Royal Commission endeavored to ascertain how much financial support for the project could be relied upon from the inhabitants of the interested districts, and they found that the citizens were not prepared to make the canal themselves, and that "it seems doubtful whether they would contribute to the cost, if for strategic reasons, . . . the Loch Lomond route were adopted in preference to the direct route, which has hitherto been favored by Glasgow opinion."<sup>3</sup> Since this second route

<sup>2</sup> *Report of Royal Com.*, VII, 183.

<sup>3</sup> *Ibid.*, 182.

alone is adapted to naval requirements it is apparent that the fate of the project rests in the hands of the imperial government. It is accordingly significant to note that the aforementioned Committee on Imperial Defense reported that while the canal would unquestionably possess some strategical value, "this value alone would, however, not be sufficient to warrant any considerable government expenditure."<sup>4</sup> It would seem, therefore, that the project is indefinitely suspended. The government is disposed to give no aid for the first-named route, because it is strategically valueless; the inhabitants of Glasgow and other cities are averse to contributing to the building of the second route, because it promises no substantial direct commercial returns to themselves; and neither party is willing to undertake its favored scheme without the co-operation of the other.

While the prospect that the project will ever be carried to execution is exceedingly remote, we may nevertheless profitably spend a few moments in a consideration of the above-mentioned commercial advantages. For vessels engaged in the coasting trade the distance saved would be some four hundred miles. Were there no counterbalancing extra costs the reductions effected here might be regarded as of some importance; but the fact is that whatever savings in fuel there might be because of the shorter distance would be largely, if not wholly, dissipated by additional expenditures for towage and for extra labor, such as tugmen, lock-keepers, and pilots, on the canal. Furthermore, since the risks incurred by large ocean vessels in navigating the restricted channel of an inland waterway are greatly increased, the insurance charges are bound to become very heavy, if not altogether prohibitive. Again, the saving in time would be largely lost on account of the slow pace necessitated on the canal and the innumerable delays, which include half-hour stops at every lock.

In the case of German vessels bound for American ports the distance saved would be much less, and it requires an unusually elastic imagination to conceive that these ships could be induced to encounter the dangers and delays and extra costs of an inland

<sup>4</sup> *Ibid.*, 183.

waterway for the sake of the mere saving of perhaps two or three hundred miles distance in the open ocean.

Nor can it be considered plausible that these ocean vessels would find it to their advantage to enter the canal for the sake of picking up freight at Grangemouth or Glasgow. Tramp steamers of the old type might possibly do so; but, as the advocates of this canal themselves say, these wandering vessels are becoming scarcer year by year as the demand grows for through cargoes on large steamers. To contend in the next sentence that German vessels would be likely to load partly at home, then cross the North Sea and encounter all the uncertainties of an inland waterway in order to finish out their cargoes is, to say the least, inconsistent; and it is as improbable as it is lacking in consistency.

Still another inducement was, however, held out to these continental vessels, namely, that of cheap bunker coal in Scotland. No evidence was submitted to show that it is any cheaper than German coal, but granting that it may be slightly cheaper, there nevertheless appears scant inducement to German ships. No difficulty is experienced by these vessels in carrying sufficient coal for the entire journey to the United States; and Scotland is at any rate only one day's journey from the North German ports. Moreover, the coal which would still have to be bought in Germany for a part of the trip would doubtless cost more per ton than when larger amounts were purchased; but on the other hand the incidental loading expenses would not be decreased proportionally with the reduced amount of fuel. In Scotland the loading equipment and incidental expenses would have to be duplicated and, in addition many hours or days of valuable time would be wasted during the process of loading. They can be fully bunkered in the home port at the same time that the cargo is being loaded. These considerations far more than offset any slight advantages that might arise from a possibly lower cost of fuel in Scotland. Hence it is unnecessary to enumerate again the further disadvantages in the way of risks, extra canal costs, etc.

There is some point to the argument that ships experience

difficulty at present in securing a full cargo on either Scottish coast, alone. Undoubtedly, the coasting trade would find the canal a convenient short-cut. We may grant all the benefits that the most optimistic could look for in this respect, and yet regard the scheme as wholly impracticable. A minimum estimate of the cost is \$100,000,000, or over \$3,000,000 per mile. To save such tremendous sums of money, in incidental wages, requires eons of time. If the coasting vessels cannot profitably carry the traffic around the island, and if it becomes necessary to collect all of the shipping upon one or the other coast, a railway, costing perhaps \$200,000 per mile—one-fifteenth of the amount of the proposed waterway—can move the traffic across country in a much more expeditious and more satisfactory manner.

Thus from whatever point of view we regard this much-discussed ship-canal project it appears hopelessly visionary. It is well that the citizens of Glasgow have come to the conclusion that they will not undertake the project unaided. It is fortunate for the present state of the imperial exchequer that the government has not been made to believe that the strategical importance is sufficient to warrant the necessary appropriations for the carrying-out of the scheme.

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